Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-21. (Canceled)

22. (Previously Presented) A method for quantitative assessment of excision and resynthesis DNA repair capacities of at least one biological medium, which method comprises the following steps of:

a) preparing a range of plasmids, each comprising distinct DNA lesions, by independent treatment of said plasmids with at least one physical or chemical treatment means or both and recovering a supercoiled fraction of each of said plasmids,

b) characterizing the lesions present on each of the plasmids of said range of plasmids,

c) depositing the plasmids of said range of plasmids, and at least one supercoiled control plasmid without lesions, onto a single solid support, according to a pre-established configuration A, so as to form a functionalized support divided into different zones A_1 to A_X, corresponding to an integer equal to the number of biological media to be simultaneously tested, each zone A_1 to A_X comprising said range of plasmids,

d) incubating said functionalized support obtained in step (c) with various repair solutions, each comprising at least one biological medium and a labeled nucleotide triphosphate and optionally containing enzyme activities for repair, ATP, an ATP-regenerating system, and optionally any other component necessary for the activity of the repair enzymes present in said biological medium, each of said repair solutions being deposited, prior to said

incubation, in each of said different and pre-established zones A_1 to A_X of said functionalized support,

e) washing said functionalized support at least once,

f) directly or indirectly measuring the signal produced by said labeled nucleotide triphosphate incorporated into the DNA during the repair reaction in step (d), in each of said different and pre-established zones A_1 to A_X,

g) recording and quantifying the signal corresponding to each deposit of plasmid in each zone A_1 to A_X, and

h) determining the ratio of the signals of the plasmids comprising the lesions relative to the control plasmid jointly deposited.

23. (Previously Presented) The method of claim 22, wherein the plasmids according to step (a) have a double-stranded supercoiled form.

24. (Previously Presented) The method of claim 22,wherein in step (a) the at least one physical or chemical treatment means which induce a lesion of the DNA are selected from the group consisting of those that induce: the formation of a single lesion, the formation of a limited number of lesions and the formation of various lesions belonging to the same family.

25 . (Previously Presented) The method of claim 22, wherein, in step (a) multiple treatment means are used on each plasmid of said range of plasmids.

26. (Previously Presented) The method of claim 22, wherein, in step (b) the characterizing of the lesions comprises (i) taking a fraction of each plasmid with lesions, (ii) digesting each of said fractions with enzymes that release the nucleosides from the DNA, and then (iii) analyzing the result of the digestion using a combination of separative techniques coupled to a quantitative analytical technique.

27 . (Previously Presented) The method of claim 26, wherein the digestion is carried out using at least one of the following enzymes: calf spleen phosphodiesterase, P1 nuclease, snake venom phosphodiesterase, or alkaline phosphatase.

28. (Previously Presented) The method of claim 26, wherein the result of the enzyme digestion is analyzed by means of one of the following techniques: high performance liquid chromatography (HPLC) coupled to tandem mass spectrometry, by HPLC coupled to gas chromatography or by HPLC coupled to electrochemical detection.

29. (Previously Presented) The method of claim 22, wherein, prior to step (c), the supercoiled forms of the plasmids obtained in step (a) are purified by sucrose gradient centrifugation or cesium chloride gradient centrifugation or both.

30. (Previously Presented) The method of claim 22,wherein, also prior to step (c), each of the plasmids of the range of plasmids is diluted to a concentration of between 5 and 100 μg/ml, in a diluting buffer.

31. (Previously Presented) The method of claim 30, wherein said buffer has a pH of between 6.5 and 8.0.

32. (Previously Presented) The method of claim 31, wherein said buffer further optionally comprises a salt and a non-ionic surfactant.

33. (Previously Presented) The method of claim 22, wherein, in step (c) the volumes of the deposits of the range of plasmids are between about 100 and 1000 picoliters.

34. (Previously Presented) The method of claim 22, wherein, in step (c), said support is a support that has been sensitized so as to increase its affinity for the DNA, and is an organic or inorganic material selected from the group consisting of glass, silicon and compounds

thereof, and synthetic or non-synthetic polymers, and the surface of which is optionally functionalized.

35. (Previously Presented) The method of claim 34, wherein said support consists of glass slides coated with poly-L-lysine that adsorb the DNA, or glass slides functionalized with epoxy groups that form covalent bonds with the DNA.

36. (Previously Presented) The method of claim 34, wherein said support comprises different zones A_1 to A_X, each of said zones comprising:

a) at least one deposit of control plasmid, and

b) a deposit of plasmid containing photoproducts, and/or

c) a deposit of plasmid containing oxidative damage, and/or

d) a deposit of plasmid containing etheno-bases, and/or

e) a deposit of plasmid containing DNA breakages, and/or

f) a deposit of plasmid containing carcinogenic substance adducts.

37 . (Previously Presented) The method of claim 22, wherein in step e), the support is washed at least once with a saline solution containing a nonionic surfactant, in particular a 10 mM phosphate buffer containing Tween 20, and is then subsequently rinsed with water at least once.

38. (Previously presented) The method of claim 22, wherein in step f), the signal is measured by means of a method suitable for the labeled nucleotide triphosphate.

39. (Previously presented) The method of claim 22, wherein, in step (g), said signals are quantified using a device capable of exciting label of the labeled nucleotide triphosphate, and of measuring the signal emitted subsequent to the excitation.

40. (Currently amended) The method of claim 39, wherein, in step (h) of the method, a numerical ratio of the signals obtained with the plasmids containing the lesions to the signal obtained with the control plasmid located on the same support is established.

41. (Previously Presented) The method of claim 22, wherein the quantitative assessment is for establishing a repair profile of the at least one biological medium.

42. (Previously Presented) The method of claim 22, wherein the quantitative assessment is for diagnosing a repair-related disease.

43. (Previously Presented) The method of claim 22, wherein the quantitative assessment is for assessing the influence of a physical or chemical treatment means on repair capacities of the at least one biological medium.

44. (Previously Presented) The method of claim 22, wherein the quantitative assessment is for screening substances capable of modulating a repair system of the at least one biological medium.

45. (Previously Presented) The method of claim 22, wherein in step d), said incubating is effected at a temperature of about 30°C for 1 to 5 hours.

46. (Previously Presented) The method of claim 45, wherein said incubating is for 3 hours.

47. (Previously Presented) The method of claim 22, wherein said distinct DNA lesions of step a) comprise oxidative lesions, photoproducts induced by ultraviolet B or C radiation, chemical adducts, etheno-bases, a basic sites or DNA breakages.

48. (Previously Presented) The method of claim 22, wherein the depositing of plasmids in step c) is conducted by a robot for producing microarrays.

49. (Previously Presented) The method of claim 22, wherein the labeled nucleotide triphosphate is labeled with ^{32}P.

50. (Previously Presented) The method of claim 22, wherein the repair solutions of step d) comprise enzyme activities for repair, and any other components necessary for the enzyme activities.